Attorney Docket No. 1670.1009

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:

Ji Hwan KEUM et al. Confirmation NO.: 7512

Application No. 11/619,512 Group Art Unit: 1763

Filed: July 16, 2003 Examiner: Richard R. Bueker

For: HEATING CRUCIBLE AND DEPOSITION APPARATUS USING THE SAME

REPLY BRIEF UNDER 37 C.F.R § 41.41

Mail Stop: Appeal Brief – Patents
Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450

Sir:

This Reply Brief is in response to the Examiner's Answer mailed December 18, 2007, the due date for the Reply Brief being February 19, 2008 (February 18, 2007 being a Federal holiday). This response addresses only those points raised in the Examiner's Answer that Applicants believe would benefit from further explanation or argument. This Reply Brief is intended to supplement rather than replace the original arguments presented in Applicants' Appeal Brief filed on October 10, 2007. Any claims or issues not specifically addressed below rely upon these original arguments.

I. Real Party in Interest

The real party of interest remains as identified in the Appeal Brief pursuant to 37 C.F.R. §41.37(c)(1)(i).

II. Related Appeals and Interferences

Although the real party in interest has other appeals and interferences, none of the other pending appeals and interferences is believed to directly affect or be directly affected by, or have any bearing upon the decision of the Board of Patent Appeals and Interferences in this appeal.

III. Status of Claims

Claim 37 was canceled in the Amendment under 37 CFR 41.22(b)(1) filed October 12, 2007.

IV. Status of Amendments

The Amendment under 37 CFR 41.22(b)(1) filed October 12, 2007 canceling claim 37 was entered.

V. Summary of the Invention

The summary of the invention remains as identified in the Appeal Brief pursuant to 37 C.F.R. §41.37(c)(1)(v). In view of the cancellation of claim 37 in the Amendment under 37 CFR 41.22(b)(1) filed October 12, 2007, the paragraph summarizing the subject matter of claim 37 may be ignored.

VI. Grounds of rejection

The summary of the invention remains as identified in the Appeal Brief pursuant to 37 C.F.R. §41.37(c)(1)(v).

VII. Arguments

1. Claims 1, 2, 6 – 12, 16 – 19, 22 – 26 and 35 - 36 are patentably distinguishable over Mori (JP 61-156809) in view of Mashita (JP 60-043480) and Morioka (JP 61-132589).

The following arguments supplement rather than replace the original arguments presented in Applicants' Appeal Brief filed on October 10, 2007. Any claims or issues not specifically addressed below rely upon these original arguments.

As noted in the Appeal Brief filed October 10, 2007, the combination of Mori, Mashita and Morioka does not teach all of the limitations of independent claims 1, 11, 32 and 35 – 36. in particular, contrary to what is alleged by the Examiner, Mashita does not teach or suggest fixing portions suspended from an inner wall of the main body; an inner member supported at positions along an outer circumference thereof by the fixing portions and the inner member having one or more separate openings formed therein along the outer circumference thereof and between the supporting positions of the fixing portions. Mashita, referring to FIG. 4, describes a lid 3 in a crucible 2 that rests on support parts 6 that are similar in form and function to the stepped portion disclosed by Mori. Contrary to what is alleged by the Examiner, there is no information in Mashita that would lead one to conclude that these support parts are fixing portions suspended from an inner wall. There is no information provided in Mashita regarding exactly how the support parts are provided in the crucible of Mashita, and the only depiction of the support parts is the cross-sectional view of the crucible provided in FIG. 4. Although FIG. 4 of Mashita shows the support parts 6 attached or fastened to the wall of the crucible, there is absolutely nothing in FIG. 4 that teaches or suggests that the support parts are suspended from the wall as recited by the present claims. M.P.E.P. §2121.04 states that a drawing in a reference used to reject claims must show all the claimed structural features and how they are put together. Therefore, the combination of the description and FIG. 4 of Mashita, alone or combined with Mora and Morishita is not enough to sustain a rejection under 35 U.S.C. §103. In addition, there is no reasonable basis for the Examiner's interpretation of the term "suspend" as merely a synonym for "attach" or "fasten." Although the dictionary referred to by the Examiner (Webster's Ninth New Collegiate Dictionary, Merriam-Webster, 1986, pages 551 and 1189) defines "suspend" as "to hang so as to be free on all sides except at the point of support," this does not mean that the term "suspend" necessarily encompasses every idiosyncratic definition of "hang" that might appear in the dictionary. In particular, although one might use the term "hang" to mean "apply to a wall" (the

particular sub-definition 4 of "hang" mentioned by the Examiner) as in "to hang wallpaper," one would not use the term "suspend" in this same context. Moreover, the examples mentioned by the Examiner in the Examiner's Answer (lighting fixtures, handrails, mounting brackets and shelves) are also instances where the term "suspend" would ordinarily not be used, particularly to describe objects that were merely attached or fastened to a wall. As noted above, there is nothing in Mashita that would teach or suggest that the support parts hang or are suspended from the wall of the crucible.

Therefore, the rejection of claims 1, 2, 6 – 12, 16 – 19, 22 – 26 and 35 - 36 under 35 U.S.C. §103 over Mori, Morioka and Mashita should be reversed.

2. **Claim 21 is patentably distinguishable over Mori (JP 61-156809) in view of Mashita (JP 60-043480) and Morioka (JP 61-132589) and further in view of Tiedje (U.S. Patent no. 5,944,903.**

The rejection of claim 21 under 35 U.S.C. §103 over Mori, Morioka and Mashita and further in view of Tiedje should be reversed for the reasons provided in Applicants' Appeal Brief filed on October 10, 2007 and for the additional reasons provided above.

3. **Claims 32 and 33 are patentably distinguishable over Mori (JP 61-156809) in view of Mashita (JP 60-043480) and Morioka (JP 61-132589) and further in view of Spahn (U.S. Patent no. 6,237,529).**

The rejection of claim 32 and 33 under 35 U.S.C. §103 over Mori, Morioka and Mashita and further in view of Spahn should be reversed for the reasons provided in Applicants' Appeal Brief filed on October 10, 2007 and for the additional reasons provided above.

IX. Conclusion

In view of the law and facts stated herein, the Appellant respectfully submits that the Examiner has failed to cite a reference or combination of references sufficient to maintain obviousness rejections of the rejected claims.

For all the foregoing reasons, the Appellant respectfully submits that the cited prior art does not teach or suggest the presently claimed invention. The claims are patentable over the prior art of record and the Examiner's findings of unpatentability regarding claims 1, 2, 6 – 12, 16 – 19, 21 – 26, 32, 33 and 35 - 36 should be reversed.

The Commissioner is hereby authorized to charge any additional fees required in connection with the filing of the Appeal Brief to our Deposit Account No. 50-3333.

Respectfully submitted,

STEIN, MCEWEN & BUI LLP

Date: Feb. 12, 2008

By: _____
Ralph T. Webb
Registration No. 33,047

1400 Eye Street, NW
Suite 300
Washington, DC 20005
Telephone: (202) 216-9505
Facsimile: (202) 216-9510

X. Appendix A

1. A heating crucible for a deposition apparatus, comprising:

a main body having a space which receives an organic compound and a nozzle through which the organic compound, vaporized, is discharged, the nozzle being defined in an upper wall of the main body;

fixing portions suspended from an inner wall of the main body;

an inner member supported at positions along an outer circumference thereof by the fixing portions to face the nozzle, the inner member having one or more separate openings formed therein along the outer circumference thereof and between the supporting positions of the fixing portions, borders of the openings being defined by separate notches in the outer circumference and the inner wall of the main body, so as to allow for a transmittance of the vaporized organic compound therethrough, wherein the upper wall is perpendicular to a transmission direction of the organic compound when the organic compound is transmitted through each of the openings.

2. The heating crucible of claim 1, wherein:

the inner member further comprises a baffle board formed on the area that faces the nozzle, and

the one or more openings are formed around an edge of the baffle board.

6. The heating crucible of claim 1, wherein the one or more openings are formed at regular intervals around the edge of the inner member.

7. The heating crucible of claim 1, wherein a sum of areas of the one or more openings of the inner member is equal to or greater than an area of the nozzle.

8. The heating crucible of claim 1, wherein a distance between the nozzle and the inner member is from a radius of the nozzle to 9/10 of a distance between the nozzle and an inner bottom surface of the main body.

9. The heating crucible of claim 1, wherein the main body comprises a cap on which the nozzle is formed and a main body part in which the space is formed.

10. The heating crucible of claim 1, further comprising a heater which is provided to the main body and/or the nozzle.

11. A deposition apparatus for forming a deposition film on a substrate, comprising:

a vacuum chamber which receives the substrate; and

a heating crucible which is installed opposite to the substrate and vaporizes an organic compound provided thereto, wherein the heating crucible comprises:

a main body having a space which receives an organic compound and a nozzle through which the organic compound, vaporized, is discharged, the nozzle being defined in an upper wall of the main body;

fixing portions suspended from an inner wall of the main body;

an inner member supported at positions along an outer circumference thereof by the fixing portions to face the nozzle, the inner member having one or more separate openings formed therein along the outer circumference thereof and between the supporting positions of the fixing portions, borders of the openings being defined by separate notches in the outer circumference and the inner wall of the main body, so as to allow for a transmittance of the vaporized organic compound therethrough, wherein the upper wall is perpendicular to a

transmission direction of the organic compound when the organic compound is transmitted through each of the openings.

12. The deposition apparatus of claim 11, wherein: the inner member further comprises a baffle board formed on the area that faces the nozzle, and the one or more openings are formed around the edge of the baffle board.

16. The deposition apparatus of claim 11, wherein a sum of areas of the one or more openings of the inner member is equal to or greater than an area of the nozzle.

17. The deposition apparatus of claim 11, wherein a distance between the nozzle and the inner member is from a radius of the nozzle and 9/10 of a distance between the nozzle and an inner bottom surface of the main body.

18. The deposition apparatus of claim 11, wherein the main body comprises a cap on which the nozzle is formed and a main body part in which the space is formed.

19. The deposition apparatus of claim 11, wherein the heating crucible further comprises a heater which is provided to the main body and/or the nozzle.

21. The heating crucible of claim 1, further comprising a temperature sensing unit which senses a temperature of the organic compound.

22. The heating crucible of claim 1, wherein:

the inner member further comprises a baffle board formed on the area that faces the nozzle, and

the baffle board is narrower than a sectional area of the space.

23. The heating crucible of claim 1, wherein the one or more openings have a predetermined area so as to prevent a pressure difference between a space below the inner member and a space above the inner member.

24. The heating crucible of claim 1 wherein the nozzle has a vertical axis that does not match with that of the opening so as to prevent the organic compound, in a predetermined form, from being transmitted through the nozzle.

25. The heating crucible of claim 1, wherein: the inner member further comprises a baffle board formed on the area that faces the nozzle, and the baffle board blocks the organic compound, in a form of a lump, from being transmitted through the nozzle.

26. The heating crucible of claim 1, wherein the inner member has a cross-section that is substantially the same as that of the space of the main body.

32. A method of producing an electroluminescent (EL) device having an organic compound, the method comprising:

obtaining a substrate of the EL device;

depositing a layer of the organic compound on the substrate using a deposition apparatus having a heating crucible including a main body which receives the organic compound, a nozzle defined in an upper wall of the main body, fixing portions suspended from

an inner wall of the main body, and an inner member supported at positions along an outer circumference thereof by the fixing portions to face the nozzle, the inner member having one or more separate openings formed therein along the outer circumference thereof and between the supporting positions of the fixing portions, borders of the openings being defined by separate notches in the outer circumference and the inner wall of the main body, so as to allow for a transmittance of the vaporized organic compound therethrough, wherein the upper wall is perpendicular to a transmission direction of the organic compound when the organic compound is transmitted through each of the openings; and

deflecting the transmitted organic compound via the upper wall of the main body.

33. The method of claim 32, wherein the inner member prevents the organic compound, in a form of a lump, from being deposited on the substrate.

35. A heating crucible for a deposition apparatus, comprising:

a main body having a space therein defined by a cylindrical wall and an upper wall which receives an organic compound and a nozzle through which the organic compound, vaporized, is discharged, the nozzle being defined in the upper wall of the main body;

fixing portions suspended from an inner wall of the main body;

a baffle board parallel with the upper wall, having one or more separate openings formed therein, that is supported by the fixing portions at positions along an outer circumference of the baffle board between the openings, borders of the openings being defined by notches in the outer edge of the baffle board and the wall of the main body, so as to allow for a transmittance of the vaporized organic compound therethrough, wherein the upper wall is perpendicular to a transmission direction of the organic compound when the organic compound is transmitted through the one or more openings.

36. A deposition apparatus for forming a deposition film on a substrate, comprising:

a vacuum chamber which receives the substrate; and

a heating crucible which is installed opposite to the substrate and vaporizes an organic compound provided thereto, wherein the heating crucible comprises:

a main body having a space therein defined by a cylindrical wall and an upper wall which receives an organic compound and a nozzle through which the organic compound, vaporized, is discharged, the nozzle being defined in the upper wall of the main body;

fixing portions suspended from an inner wall of the main body;

a baffle board parallel with the upper wall, having one or more separate openings formed therein, that is supported by the fixing portions at positions along an outer circumference of the baffle board between the openings, borders of the openings being defined by notches in the outer edge of the baffle board and the wall of the main body, so as to allow for a transmittance of the vaporized organic compound therethrough, wherein the upper wall is perpendicular to a transmission direction of the organic compound when the organic compound is transmitted through the one or more openings.